Claims

1. A method of producing 1,2-dichloroethane or ethylene (di)chloride (EDC) using a circulating reaction medium and a catalyst, whereby ethylene and chlorine are supplied to the reaction medium, characterized in that the ethylene or chorine gas are introduced into the reaction medium by means of microporous gas diffuser elements in order to produce gas bubbles with a diameter of 0.3 to 3 mm.

2. A method of producing 1,2-dichloroethane or ethylene (di)chloride (EDC) using a circulating reaction medium and a catalyst, whereby ethylene and chlorine are supplied the reaction medium, characterized in that the chlorine is dissolved in a cooled part stream of the reaction medium and subsequently supplied to the main stream of the reaction medium.

3. A method of producing 1,2-dichloroethane or ethylene (di)chloride (EDC) using a circulating reaction medium and a catalyst, whereby ethylene and chlorine are supplied to the reaction medium, characterized in that viewed in the direction of circulation of the reaction medium, ethylene is introduced into the circulating reaction medium at a point upstream and, after passing through a mixing and dissolving zone, chlorine is

supplied to the stream of reaction medium farther downstream, whereby the ethylene (di)chloride liberated with the help of the reaction of chlorine and ethylene and evaporated by the reaction heat is discharged from the reactor vessel in the gaseous state, whereas the residual amount remaining in the evaporator vessel is recycled into the reaction zone.

4. The method according to any one of the preceding claims, characterized in that a medium predominantly containing 1,2-dichloroethane is used as the reaction medium.

5. The method according to any one of the preceding claims, characterized in that a temperature of about 75°C to 200°C and a pressure of about 1 to 15 bar are adjusted in the mixing and reaction zone, and that the flow-through velocity is controlled in such a way that the dwelling time of the reaction mixture in the mixing and reaction zone amounts to about 1 to 30 seconds.

6. The method according to any one of the preceding claims, characterized in that the EDC formed first remains in the liquid phase or evaporates within the zone of the surface of the evaporator vessel, whereby the evaporation cold is compensated by the reaction heat.

7. The method according to any one of the preceding claims,

characterized in that the chlorine is separately dissolved in the liquid and supplied to the reaction medium.

8. A device for carrying out the method according to any one of the preceding claims, characterized by an evaporator vessel (2), a down pipe (4) and a riser (6), whereby in the direction of flow, provision is made first for an ethylene feed, subsequently for a dissolving zone, and thereafter for distributor pipes for introducing the chlorine dissolved in a bypass stream (16) of the reaction medium into the main stream of the reaction medium.

9. The device according to claim 8, characterized in that provision is made in the flow path of the reaction medium for a circulation device for producing a forced circulation, and for a throttle valve (22) or the like for the control.

10. The device according to claim 8 or 9, characterized in that provision is made for a bypass line (16) for the reaction medium, said bypass comprising a pump (17), a heat exchanger (18) serving for cooling said part stream, a liquid-jet compressor (19) downstream for aspirating and introducing gaseous or liquid chlorine into the bypass stream, and/or a static mixer, as well as a feed into a ring line (26) with distributor tubes (14) for introducing the bypass stream into

the main stream.

11. The device according to claim 8 or any one of the succeeding claims, characterized in that for measuring the flow-through in the main stream, provision is made for an ultrasound measuring device as well as for a control for actuating a flow-through control valve (22) or the like.

12. The device according to claim 8 or any one of the succeeding claims, characterized in that at least two risers (6, 6a) with the installations as defined by the invention are associated with one down pipe (4).

13. The device according to claim 8 or any one of the succeeding claims, characterized by a multitude of evaporator vessels (2) comprising one or several down pipes and risers (4, 6), whereby one or more reaction zones (12) are arranged there in the one or more circulation lines.

14. The device according to claim 8 or any one of the succeeding claims, characterized in that each unit comprising an evaporator vessel (2), a down pipe (4) and a riser (6) with installation, is realized in the form of a module with devices for coupling it with at least one or more adjacent modules.

15. The device according to claim 8 or any one of the subsequent claims, characterized in that provision is made in the bypass for a mixer with a heat exchanger as one unit in terms of device.

16. The device according to claim 8 or any one of the succeeding claims, characterized in that provision is made in the main stream for microporous gassing elements (10) for finely distributing the ethylene to be introduced.

17. The device according to claim 8 or any one of the succeeding claims, characterized in that provision is made in the reaction zone (12) for flow-rectifying devices such as baffle plates (13) throttling valves or the like.

18. The device according to claim 8 or any one of the succeeding claims, characterized in that a flow rectifier (9) is arranged upstream of the gassing elements (10) for producing a uniform velocity profile as well as for suppressing radial velocity components in the main stream.

19. The device according to claim 8 or any one of the succeeding claims, characterized in that a nozzle is arranged in the loop reactor for introducing the concentrated chlorine solution in the circulating main stream.

20. The device according to claim 8 or any one of the succeeding claims, characterized in that for introducing small amounts of preheated nitrogen, provision is made on a distributor ring (28) in the riser (6b) of the loop reactor for candles (29), the latter being made of a rough, porous material preferably consisting of ceramics or sintered metal (FIG. 6).